

Claims:

1. A granule comprising a plurality of layers with a core having at least one inner layer proximate to the core and at least one outer layer distal to the core, wherein said granule contains biosolid material.

2. The granule of claim 1 wherein the core comprises a biosolid material.

3. The granule of claim 2 wherein the non-biosolid material comprises class A biosolids.

4. The granule of claim 1 wherein one or more of the plurality of layers comprise non-biosolid materials.

5. The granule of claim 4 wherein the non-biosolid materials are selected from the group consisting of ammonium sulfate, azo-group based polymers, calcium-linked polymer, cationic-linked polymers, diammonium phosphate, dried organic materials, dried inorganic materials, fertilizers, lignins, magnesium-linked polymers, natural polymers, nutrient fertilizers, plant polysaccharides, synthetic polymers, and combinations thereof.

6. The granule of claim 1 which has a diameter of less than about 10 mm.

7. The granule of claim 1 which contains less than ten percent water.

8. The granule of claim 1 wherein one or more layers of said granule, but not all, have a higher pH than the core or one or more other layers of said granule.

9. The granule of claim 1 wherein one or more layers, but not all, have a higher moisture level than said core or one or more other layers of said granule.

10. The granule of claim 1 wherein one or more layers, but not all, have a higher Eh than the core or one or more other layers of said granule.

11. The granule of claim 1 wherein one or more layers, but not all, have a higher degree of hardness than said core or one or more other layers of said granule.

12. The granule of claim 1 wherein the at least one outer layer comprises a non-biosolid that reduces the rate of emission of odorants associated with said granule.

13. The granule of claim 1 further comprising a coating that at least partially encapsulating said granule.

14. The granule of claim 13 wherein the coating comprises a material selected from the consisting of argose, biodegradable polymers, ethylene, ethylene vinyl acetate copolymer, polyacrylamide, polyethylene, polypropylene, polystyrene, propylene copolymer, vinyl chloride, vinylidene chloride, vinylidene chloride-vinyl chloride copolymer, and combinations thereof.

15. The granule of claim 1 further comprising one or more micronutrients.

16. The granule of claim 15 wherein the micronutrients are located in the core, in one or more of the plurality of layers, or both.

17. The granule of claim 15 wherein the micronutrients are selected from the group consisting of ammonia, boron, cobalt, calcium, copper, iron, magnesium, manganese, molybdenum, zinc, and any salts thereof, and combinations thereof.

18. The granule of claim 16 wherein the salts are selected from the group consisting of as ammonium molybdate, boric acid, calcium nitrate, chelated complex of copper, cobalt chloride hexahydrate, copper nitrate, copper sulfate, disodium dihydro molybdate, ferrous nitrate, ferrous sulfate, magnesium nitrate, magnesium sulfate, manganese nitrate, manganese sulfate, nickel chloride hexahydrate, potassium chloride, sodium borate, sodium molybdate, zinc nitrate, zinc sulfate, and combinations thereof.

19. The granule of claim 15 wherein the zinc is present in a concentration greater than about 2,000 ppm.

20. The granule of claim 15 further comprising a coating such that said micronutrients are released from said granule in a timed release fashion.

21. The granule of claim 1 further comprising microorganisms.

22. The granule of claim 21 wherein the microorganisms are capable of metabolizing a toxic chemical or compound, replenishing depleted soil microflora, enhancing the transfer of nutrients to a target crop, or a combination thereof.

23. A bioremediation method comprising contacting a plurality of biosolid-containing granules of claim 1 to an area in need thereof.

24. The method of claim 23 wherein the area is a body of land or water.

25. The method of claim 23 wherein the biosolid-containing granules further contain microorganisms, micronutrients or both.

26. The method of claim 25 wherein the microorganisms metabolize contaminants present in said area.

27. The granule of claim 1, further comprising a toxin.

28. A method for fertilizing an area comprising contacting a plurality of biosolid-containing granules of claim 1 to an area in need thereof.

29. The method of claim 28 wherein the area is a body of land or water.

30. The method of claim 28 wherein the biosolid-containing granules comprises cationic polymer and zinc.

31. A method for treating an area with a toxic compound comprising contacting said area with a plurality of biosolid-containing granules of claim 1 that further contains said toxic compound.

32. The method of claim 31 wherein the toxic compound is selected from the group consisting of herbicides, insecticides, pesticides, and combinations thereof.

33. A method for the delayed release of a desired substance to an area comprising contacting a plurality of biosolid-containing granule of claim 1 to said area wherein one or more outer layers of said granules comprise a heat-sensitive polymer that delays release of said desired substance from the granule until exposed to a certain temperature.

34. The method of claim 33 wherein the desired substance is selected from the group consisting of fertilizers, herbicides, micronutrients, pesticides, and combinations thereof.

35. The method of claim 33 wherein the temperature is greater than 15°C.

36. A method for the delayed release of a desired substance to an area comprising contacting a plurality of biosolid-containing granule of claim 1 to said area wherein one or more outer layers of said granules comprise a water-sensitive polymer that delays release of said desired substance from the granule until exposed to water.

5 37. The method of claim 36 wherein the water content exceeds 30%.

38. A method of manufacturing a biosolid-containing granule comprising:
generating a core particle of biosolid material; and
applying a layer of material to said core particle.

10 39. The method of claim 38 wherein the core particle is generated by a process selected from the group consisting of a hydraulic fracturing, freeze wall placement, jet grouting, rotary hallow stem/trimmie placement, and combinations thereof.

15 40. The method of claim 38 wherein the layer is formed by a process selected from the group consisting of a cross-pipe reaction process, a spouting fluidized bed drying process, and combinations thereof.